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Increased resistance to virus infection through overexpression of some important host genes involved in plant defense in potato (*Solanum tuberosum* L.)

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Potato (*Solanum tuberosum* L.) is the world's fourth-largest food crop. Viral diseases cause economic losses through lower yields and reduced quality of plant products. PVY and PVA have gained attention as devastating viruses in potato farming. One of the most practical ways for resistance is to use plant potential for identifying useful genes. Microarray meta-analysis methods was shown to be a potent method for integration of a potentially large number of datasets and also for identifying candidate genes. In this study, mmicroarray meta-analysis was performed using nine microarray experiments during the interaction between potato plants and viruses combined with filtering criteria based on comparing resistant and susceptible host dataset and combining data derived from microarray experiments with biotic (bacterial and fungal infections, nematode and insect attack) and abiotic (cold, heat, salt and drought) stresses dataset. Finally, 42 genes were identified that response especially to the virus infection (specific virus genes) and 265 genes were also identified that not only in virus but also in other stresses (General virus genes) (Figure 1). We sought to query the response of some important genes that the product of their act in way of response to damage-causing viruses potatoes and have an important role in resistance to these viruses and some other stresses. For this purpose, three genes among 265 genes include; GTP-binding protein (SAR1), Aspartic protease inhibitor (API) and Mitogen-activated protein kinase 4 (MAPK4) were selected for further study. Overexpression construct (pRI201) with cDNAs encoding these genes under the control of CaMV35S constitutive promoter introduce into the Desiree potato cultivar using Agrobacterium tumefaciens–mediated transformation strain LBA4404.

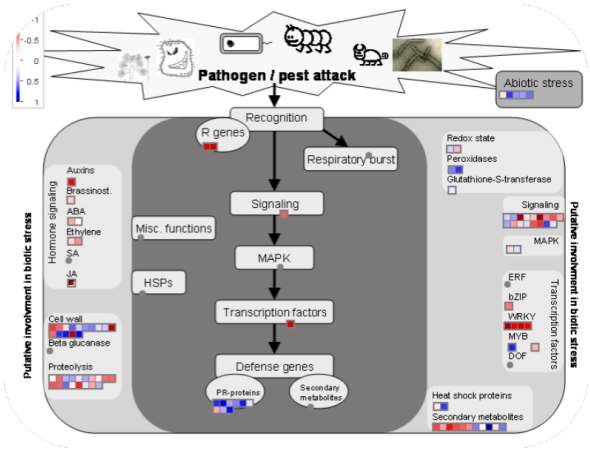

Figure 1. MapMan analysis of selected General virus genes. Each square represents the log2 ratio of expression of one gene in virus- vs. mock-inoculated plants (red, up-regulated; blue, down-regulated).

Biography

Mohammad Sadegh Sabet received a Ph.D. in Plant Breeding (Molecular Genetics and Genetic Engineering) from Tabriz University, Tabriz, Iran in 2011. He is assistant professor in Department of Plant Breeding, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran. His research interest areas are plant molecular genetics and genetic engineering.

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